# OUTLOOK FOR POPULATION AND HIGHER EDUCATION ENROLLMENTS IN OHIO

By

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JUNE, 1964

Prepared for

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Academy for Educational Development, Inc.
New York, New York

## Introduction

Expanding population and the impact of automation on the level of education needed to obtain jobs will place unprecedented demands upon Ohio's institutions of higher education in the decades ahead. This report, presenting key data on the outlook for higher education in Ohio, describes the underlying economic and demographic trends shaping the demand for higher education in Ohio -- basic trends in population, college eligibles, occupations, mobility, migration, income, expenditure, and other factors. These are not only the essential ingredients for constructing our projections, but indispensible to effective planning for the challenge facing higher education's policy makers and administrators in Ohio.

The findings and projections in this report are based upon the distillation of a considerable array of data and technical studies, published and unpublished from agencies of the Federal Government -- the U.S. Bureau of the Census, the Departments of Commerce, Labor (the Bureaus of Labor Statistics, Employment Security, OMAT), Health, Education and Welfare, Office of Education, the Advisory Commission on Intergovernmental Relations -- as well as various agencies of the State of Ohio. Among these are the Ohio Bureau of Unemployment Compensation, The Ohio Board of Regents, the Ohio Department of Industrial and Economic Development and the Department of Public Instruction. In addition, research findings of various independent organizations such as the National Education Association and the National Planning Association are utilized. Also, a number of experts in various fields relating to this study were consulted. Following is, first, a brief account of the principal findings of this report and, then, a detailed discussion of the various tables.*

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* My efficient and perceptive statistical assistant in this project was C. Jean Strahle of the American University. She cheerfully carried the formidable computation load which is the backbone of any project of this sort.

## Highlights of Findings

1. Population: The birth rate in Ohio, following the trend of the nation, has dipped in the last few years and the projected birth rates are held at a correspondingly lower level. This has resulted in a drop in annual births from a little over 234 thousand in 1958, the nadir of a steady three decade rise, to about 211 thousand in 1963. (See Tables 1 and 2). Despite this trend and the conservative assumption about future birth rates, the population in Ohio is projected to rise from 9,706,397 in 1960 to 13,269,932 by 1980, a rise of about 37%. If the birth rate should turn up again, and it well could, then the figure for 1980 would be even higher. By area, the pattern of population increases between 1960 and 1980 is diverse, showing virtual stability in the southeast area of Ohio, in contrast to significant increases greater than the all-state average, in the Cleveland and Southwest areas. (See Table 3). These correspond to my projections of the pattern of economic growth in Ohio.

2. The Challenge of Automation - College Before Jobs: When the upgrading of educational requirements for employment is combined with both an improved financial and scholastic ability to go to college (larger proportions of Ohio's youth will be high school graduates) (See Table 9) only one consequence can follow -- more eligibles will be going on to higher education, be it Junior College or University. As a percentage of the 18-24 year olds, enrollments will rise from 22.9% of the group in 1962 to 45% in 1985, according to my projections (Table 10).

The manpower outlook in Ohio closely resembles that of the United States as a whole. Just as the nation faces "a continuation of major structural changes in the industrial and occupational distribution of employment" (from the Manpower Report of the President) so does Ohio. The semi-skilled will find it increasingly difficult to get and to hold jobs with employment opportunities going to the skilled. This is reflected in the occupational distribution of Ohio's labor force projection to 1980 and of course, a direct consequence of automation -- the taking over of routine and repetitive tasks by automatic equipment. (See Table 4). The range of jobs for which a high school diploma is adequate has already begun to shrink visibly and the portent for the future is ominous. Despite words of reassurance, this is borne out in study after study. In a survey by the magazine "Automation", 84.1% of 3440 plants surveyed reported "increased skills were required" because of automation. This development will be described more fully below but suffice it to say that this has broad implications for higher education which will have to bear the brunt of this swelling demand for education beyond the high school level. In fact, the demand for more education will be rising much faster than the population projections alone would indicate.

3. Enrollments in Higher Education. In the next twenty years total enrollments in Ohio's colleges and universities will more than triple, climbing, according to my calculations, from a total of approximately 215 thousand in 1963 to about 714 thousand in 1985. This is, by an standard, a sobering and challenging prospect; one which calls for a high order of advance planning combined with considerable sagacity. An accelerated

growth in enrollments at the graduate level would suggest that the needs for educational resources -- highly qualified faculty and complex equipment -- will rise relative to the already heightened pace of increase in college enrollments.

By 1985, approximately 80 thousand of the total enrollment will consist of out-of-state students. This will be partially offset by a flow of 64 thousand Ohio residents to out-of-state institutions of higher learning.

The heavier share of the prospective increases in higher education enrollments will have to be carried by State of Ohio funds; for my projected rises in enrollment fall more heavily on the public sector than on the private. Enrollments in the public colleges and universities increase from approximately 125 thousand to over 535 thousand in 1985 compared to 89 thousand and 178 thousand, respectively, for the private institutions.

## The Statistical Picture

The following sections describe and analyze the basic data of this report and bring out the assumptions underlying the various projections. The data have been selected to tell the story, as succinctly as possible, of the future of higher education in Ohio using the best statistical data available. Although considerable quantities of additional data might have been presented, they would not give any more insight into the nature of the demand for higher education in Ohio in the decades ahead or the magnitude of the problems facing educational policy makers in Ohio.

Births and Birth Rates in Ohio: Tables 1 and 2

Records of births and the derived birth rates are among the most accurate of the key statistics underlying population data. Projections of births, however, depend upon careful interpretation of a host of factors -- some highly subjective -- affecting the rate of child bearing. The measures include fertility levels, marriage rates, age distributions of females and other key demographic factors. Fortunately, the U. S. Bureau of the Census has developed its techniques to as high a level as is possible, given the unknowns in any projection. Recently birth rates have declined throughout the country and on the basis of this behavior, the Bureau has revised downward its outlook for the future of birthrates. The birth projections for Ohio follow the Bureau in this regard. Table 1 presents the actual data on births in Ohio for the last 33 years. It can be seen, however, that through 1981 a large share of prospective college students have already been born, i.e., those born last year (1963) will be the 18 year olds entering college in 1981, etc.

The implicit birth rates arrayed in Table 2 are those underlying both the actual data on births and the estimates for future years which I rely upon for my basic population projections. These estimates are based on birth assumptions underlying the U.S. Bureau of the Census series III2 population projections which are as follows: Fertility will decline from the 1955-57 level to the 1949-51 level (a gross reproduction rate of 1.54) by the 1965-70 period; if the rate were to rise, and a number of factors could send it upwards, then the birth rates and population projections would have to be revised upward. By way of explanation, it should be mentioned that the gross reproduction rate (the GRR) approximates the average

## Table 1

## Number of Births in Ohio
## 1930-1960

| Year of Birth | No. of Births | Year Birth Group Is 18 Years of Age |
|---|---|---|
| 1930 actual | 118,260 | 1948 |
| 1940 actual | 120,193 | 1958 |
| 1945 actual | 132,496 | 1963 |
| 1950 actual | 187,649 | 1968 |
| 1955 actual | 223,470 | 1973 |
| 1958 actual | 234,350 | 1976 |
| 1960 actual | 230,718 | 1978 |
| 1963 actual | 211,305 | 1981 |

Source: 1940, 1950 & 1960 - Statistical Abstract of the United States, 1963, U.S. Dept. of Commerce, Table 51, pg. 53.

1963 - Monthly Vital Statistics Report, U.S. Dept. of Health, Education and Welfare, Vol. 12, No. 12, Table 1, pg. 3.

1930, 1945, 1955, 1958 - Vital Statistics Division, Dept. of Health, Education and Welfare

## Table 2

### Implicit Birth Rates for Ohio, 1940-1970
### (births per 1000 population)

| Year | Rate |
|---|---|
| 1940 | 16.6 |
| 1941 | 18.1 |
| 1942 | 20.8 |
| 1943 | 21.1 |
| 1944 | 19.4 |
| 1945 | 19.3 |
| 1946 | 22.6 |
| 1947 | 25.6 |
| 1948 | 23.7 |
| 1949 | 23.8 |
| 1950 | 23.6 |
| 1951 | 25.3 |
| 1952 | 25.7 |
| 1953 | 24.8 |
| 1954 | 25.0 |
| 1955 | 24.9 |
| 1956 | 25.9 |
| 1957 | 26.4 |
| 1958 | 24.8 |
| 1959 | 24.3 |
| 1960 | 23.8 |
| 1961 | 23.3 |
| 1962 | 22.4 |
| Estimated | |
| 1960-65 | 22.6 |
| 1965-70 | 22.3 |

Source: 1940-49 - Division of Vital Statistics, Dept. of Health, Education and Welfare

1950-60 - _Vital Statistics of the United States_, Vol. 1, Section 1, Table 1-AB, pg. 36.

1961-62 - _Statistical Abstract of the United States-1963_, Dept. of Commerce, Table 51, pg. 53.

Estimates - Based on assumptions underlying Bureau of Census Population Estimates, Series III.

number of daughters a woman will be expected to have by the end of the child-bearing period.

Population Trends in Ohio - Tables 3 - 7

Population trends are, of course, key determinents of both the quantity and the structure of the demand for higher education. Tables 3 through 7 tell a dramatic story of the past and future trends of population in Ohio -- its growth, occupational and geographical shifts, and generating of college age eligibles.

Population Distribution

The overall projected rise of population in Ohio between 1960 and 1980 from under 10 to over 13 million is by no means evenly distributed by the six major areas of the state. This is shown vividly in Table 3. These estimates are based upon the best judgment of the specialists on economic and industrial trends in Ohio. Following is a tabulation of the rate of growth by these six areas (see map):

| | 1960-70 | 1970-80 | 1960-80 |
|---|---|---|---|
| 1. Cleveland | 20.7% | 16.7% | 40.9% |
| 2. Northwest | 15.0% | 12.7% | 29.7% |
| 3. Southwest | 21.5% | 17.3% | 42.5% |
| 4. Central | 20.7% | 16.8% | 41.0% |
| 5. Southeast | 3.8% | 3.6% | 7.5% |
| 6. Northeast | 19.3% | 15.8% | 38.1% |
| Total | 18.6% | 15.3% | 36.7% |

It is apparent that the population trends are closely tied to the relative shift between agricultural and industrial employment, and within the latter, to the differences in outlook for the major industries of Ohio.

Following the Bureau of the Census, their population projections based upon Series III-2 assumptions have been adopted. In addition to the birth rate and fertility assumptions described above, the Series III-2

## Table 3

## Total Population in Ohio, 1930 - 85
## by Geographic Areas

| | Area | 1930 | 1940 | 1950 | 1960 | 1965 | 1970 | 1975 | 1980 |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Cleveland Area | 1,436,110 | 1,467,764 | 1,719,014 | 2,154,735 | 2,383,489 | 2,601,348 | 2,819,210 | 3,037,069 |
| 2. | Northwest Area Toledo | 815,033 | 847,146 | 945,834 | 1,108,229 | 1,193,486 | 1,274,685 | 1,355,881 | 1,437,080 |
| 3. | Southwest Area Cincinnati, Dayton | 1,439,118 | 1,499,057 | 1,811,463 | 2,293,034 | 2,545,859 | 2,786,644 | 3,027,430 | 3,268,215 |
| 4. | Central Area Columbus | 977,834 | 1,038,624 | 1,226,472 | 1,537,531 | 1,700,838 | 1,856,368 | 2,011,897 | 2,167,427 |
| 5. | Southeast Area | 763,365 | 801,563 | 782,708 | 812,688 | 828,428 | 843,419 | 858,408 | 873,399 |
| 6. | Northeast Area Canton, Youngstown, Akron | 1,215,237 | 1,253,458 | 1,461,136 | 1,800,180 | 1,978,177 | 2,147,699 | 2,317,221 | 2,486,742 |
| 7. | Total | 6,646,697 | 6,907,612 | 7,946,627 | 9,706,397 | 10,630,277 | 11,510,163 | 12,390,047 | 13,269,932 |

Source: U.S. Census 1960 - P C (1) 37A Ohio Table 6, pg. 15
1950 - Vol. II, part 35 Table 12, pg. 55
1940 - Vol. II, part 5 Table 4, pg. 815
1930 - Vol. III, part 2 Table 11, pg. 466

Projections: (Ohio Department of Industrial and Economic Development and U.S. Bureau of the Census Estimates) Based on Census Series III-2 assumptions.

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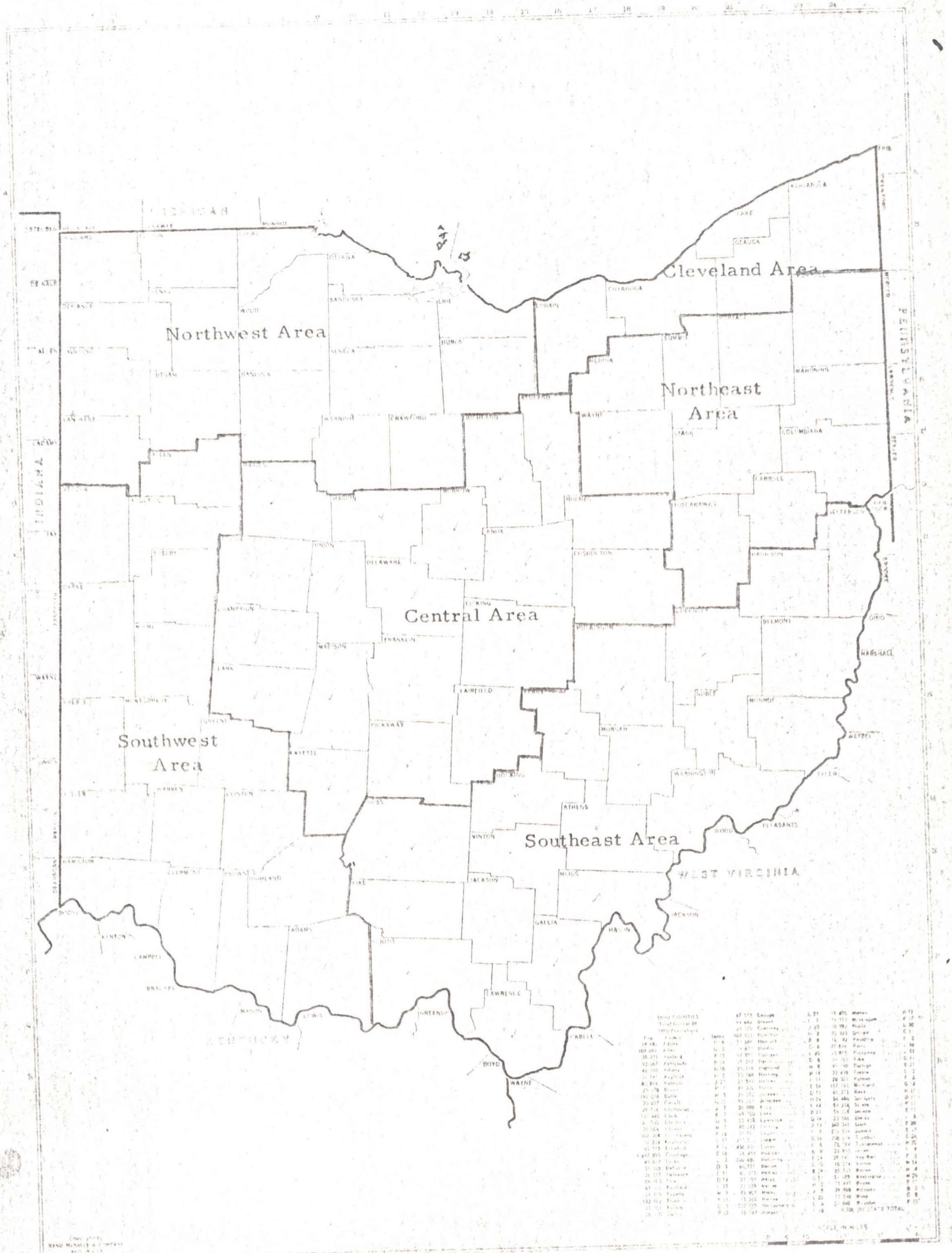
# STATE COUNTY OUTLINE MAP

OHIO

SIZE 8½ x 11



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projections assume that the amount of net migration for the state as a whole during each 5-year period of the projection span will equal one-half the amount which occurred in the 1955-60 period. These yield slightly higher totals than the Series III-1 which might have been used and slightly lower totals than the Series II-2 projections. It should be noted, however, that the Bureau of the Census has consistently erred on the side of conservatism. Consequently, it may well be that soon again their prediction of things to come in population growth will have to be revised upward. In that event so would those of this report as well as those of the Ohio Department of Industrial and Economic Development upon which the apportionment of the future population by major area is based.

In arriving at the decision as to which trends to follow in the population projections a close study has been made of those underlying the state projections of the U.S. Senate Select Committee on Water Resources, the Outdoor Recreation Resources Review Commission, the National Planning Association and the National Education Association. All of these are, it becomes clear, closely tied to Bureau of the Census projections.

## Occupational Trends

Major breakthroughs in the design and production of electronic equipment and other forms of automated production are replacing increasing numbers of routine workers with machines. With the outlook for the future for more of the same, major shifts in the composition of the Ohio labor force toward the more skilled and better educated are predicted. A Bureau of Labor Statistics study of the installation of electronic data processing in 20 offices in private industry shows dramatically what happens to certain classes of jobs when automation is introduced. They report as follows:

> The introduction of a large-scale electronic computer increased data processing capacity and provided a means of achieving significant operating savings on a variety of large-scale routine activities such as payroll preparation and billing.

The B.L.S. report shows that 2815 employees were replaced by the electronic data processing equipment in the companies and only 915 employees, all with much higher levels of training, were required to run the equipment which not only did the work of the previous employees but also filled a large number of new assignments which would have been done by additional routine workers. After extensive preparation and considerable retraining, a total of 742 or only 26% of the displaced employees were converted into new electronic data-processing positions. (See "Adjustments to the Introduction of Office Automation," Bulletin No. 1276, U.S. Department of Labor).

The projections in Table 4 of the trends in the population in Ohio by occupation groups reflect this increasing demand for the skilled professional workers as well as other influences on the composition of the work force. They furnish an important guide to determining training and educational needs for the future. The figures reflect the increasing entry of women into the work force. Employment in the farm sector is expected to fall not only relatively but absolutely, while laborers will hold their own only in absolute numbers. We have consulted numerous sources in Washington, D.C. and in Ohio concerning these trends. The Ohio Bureau of Unemployment Compensation has done a good deal of excellent work in projecting manpower needs and we have been guided by their findings and projections, particularly those for specific labor market areas. As the Bureau's director of research states "the fastest growth in Ohio's employment will occur among occupations requiring the most education and training." (Jobs and Workers 1970, William Papier)

Tab

## Total Population of Ohio, 1940-80 by Selected Occupation Groups

| Occupation Group | 1940 | 1950 | 1960 | 1970 | 1980 |
|---|---|---|---|---|---|
| 1. Employed persons | | | | | |
| (a) Professional, technical and kindred workers | 178,000 | 263,909 | 381,502 | 562,063 | 735,026 |
| (b) Farmers, farm managers, farm foremen, farm laborers | 251,205 | 205,350 | 118,361 | 102,382 | 92,144 |
| (c) Managers, officials and proprietors, excluding farms | 201,285 | 253,254 | 261,905 | 325,405 | 374,814 |
| (d) Clerical and kindred workers | 260,908 | 394,279 | 501,653 | 655,036 | 788,571 |
| (e) Sales workers | 166,194 | 223,503 | 256,565 | 329,631 | 389,418 |
| (f) Craftsmen, foremen, and kindred workers | 340,270 | 505,204 | 538,295 | 650,810 | 754,497 |
| (g) Operators (mainly unskilled) | 498,715 | 704,817 | 731,418 | 845,208 | 919,999 |
| (h) Private household workers | 89,653 | 56,892 | 68,294 | 88,747 | 102,222 |
| (i) Service workers, excluding household | 170,428 | 230,953 | 284,541 | 393,022 | 491,640 |
| (j) Laborers, except farm and mine | 167,816 | 183,651 | 177,227 | 177,227 | 177,227 |
| (k) Occupations not reported | 20,493 | 37,793 | 185,119 | 96,509 | 42,162 |
| Subtotal - employed persons | 2,344,967 | 3,059,605 | 3,504,880 | 4,226,040 | 4,867,720 |
| 2. Other persons not included above | | | | | |
| (a) Going to school | 1,365,601 | 1,455,800 | 2,343,557 | 3,079,434 | 3,746,376 |
| (b) Housewives not included above | 1,626,626 | 1,790,095 | 1,626,103 | 1,882,391 | 2,055,913 |
| (c) Children below school age | 628,345 | 959,954 | 1,293,062 | 1,678,200 | 1,935,067 |
| (d) Members of the labor force classified as unemployed, military retired persons, inmates of penal or health institutions, and persons not in labor force, etc. | 942,073 | 681,173 | 938,795 | 644,098 | 664,856 |
| 3. Total population | 6,907,612 | 7,946,627 | 9,706,397 | 11,510,163 | 13,269,932 |

Source: Census Bureau, Labor Dept.-1960 Census- PC (1) 37B-Table 16, pg. 55; 37C-Table 44, pg. 229; 37C - Table 52, pg. 235; 37C - Table 57, pg. 238.
1950 Census - Vol.II, Part 35 - Table 15, pg. 57; Table 18, pg. 62; Table 25, pg. 65; Table 29, pg. 68
1940 Census - Vol.II, Part 5 - Table 7, pg. 545; Table 11, pg. 551; Table 18, pg. 563; Table 16, pg. 560
Totals are from Table 3.
Estimates based on Manpower in Ohio, Ohio Bureau of Unemployment Compensation, Division of Research and Statistics, Table 21, pg. 38, and on other available information on labor market trends in Ohio, including discussions with regional experts in the U.S. Departments of Labor and Commerce.

## The College Age Eligibles

Analysis of population trends enables us to obtain a set of key figures which are essential for building up the projections of the numbers of college and university students. Tables 5 - 7 present the past and future distributions of Ohio youth in the age groups 18-21 and 18-24. My historical data come from the U.S. Census of Population. The projections assuming a mortality rate of o.1% per year are built up on the basis of summing the population by single year of age. These three tables analyze the college age eligibles in several ways: by various age groupings between 18 and 24, by single year of age, and by the six geographic areas of the state. The distribution by area follows the population trends assumed in making the area population estimates in the tables described earlier. Analysis of the data shows that through 1980 the proportion of college age eligibles in the population will continue to grow. Following is a tabulation by decade:

18-24 year olds as a percentage of total population in Ohio

| Year | Percent |
|---|---|
| 1960 | 8.42 |
| 1970 | 11.17 |
| 1980 | 11.77 |

Tables 8 and 9 present essential information on past and future trends in the numbers of high school graduatesin Ohio, the pool from which the universities draw. In 1963 the number of high school graduates was 73.5% of 18 year olds in the state. It is assumed that this ratio will climb steadily, reaching at least 90% by 1980, on the basis of the following expectations: (1) the drop-out problem will be brought under control,

## Table 5

## 18-21 Year Old Population in Ohio, 1930-80 by Geographic Area

| | Area | 1930 | 1940 | 1950 | 1960 | 1965 | 1970 | 1980 |
|---|---|---|---|---|---|---|---|---|
| 1. | Cleveland Area | 102,815 | 106,853 | 84,880 | 94,041 | 135,350 | 173,519 | 204,299 |
| 2. | Northwest Area | 51,576 | 58,184 | 51,463 | 52,619 | 67,675 | 85,224 | 96,351 |
| 3. | Southwest Area | 95,401 | 101,650 | 101,081 | 114,679 | 145,017 | 185,804 | 219,465 |
| 4. | Central Area | 62,823 | 73,021 | 73,607 | 88,462 | 96,678 | 123,613 | 145,418 |
| 5. | Southeast Area | 52,974 | 59,055 | 44,323 | 44,176 | 47,131 | 56,048 | 58,881 |
| 6. | Northeast Area | 83,448 | 95,112 | 78,462 | 82,013 | 112,388 | 143,576 | 167,721 |
| 7. | Total | 449,037 | 493,875 | 433,816 | 475,990 | 604,239 | 767,784 | 892,135 |

Source: Computed from -- 1950-1960 - 1960 *Census* PC (1) 37 B, Table 27, pgs. 165-187
1950-1940 - 1950 *Census* Vol. II, Part 35, Table 41, pgs. 143-157
1930-1940 - 1940 *Census* Vol. II, Part 5, Table 22, pgs. 572-589

Estimates for 1965-85 based on population changes of table 3.

Totals from Table 7, following.

## Table 6

### 18-24 Year Old Population in Ohio, 1960-1980 by Geographic Areas

| Area | 1960 | 1965 | 1970 | 1980 |
|---|---|---|---|---|
| 1. Cleveland Area | 165,748 | 223,763 | 290,531 | 357,647 |
| 2. Northwest Area | 88,794 | 111,881 | 142,695 | 168,672 |
| 3. Southwest Area | 198,357 | 239,746 | 311,100 | 384,198 |
| 4. Central Area | 150,527 | 159,830 | 206,972 | 254,570 |
| 5. Southeast Area | 72,037 | 77,917 | 93,844 | 103,077 |
| 6. Northeast Area | 142,293 | 185,803 | 240,395 | 293,614 |
| 7. Total | 817,756 | 998,940 | 1,285,537 | 1,561,778 |

Source: 1960 Census (PC (1) 37B, Table 27, pgs. 165-87

Totals taken from Table 7.

Estimates based on population changes calculated in Table 3.

## Table 7

## 18-21 and 22-24 Year Old Population in Ohio by Single Years Of Age, 1958-1985

| Year | 18 | 19 | 20 | 21 | Subtotal 18-21 | Subtotal 22 - 24 | Total 18 - 24 |
|---|---|---|---|---|---|---|---|
| Actual | | | | | | | |
| 1958 | 112,754 | 113,873 | 117,996 | 111,774 | 456,397 | N.A. | N.A. |
| 1959 | 115,059 | 112,641 | 113,759 | 117,878 | 459,337 | N.A. | N.A. |
| 1960 | 131,537 | 114,944 | 112,529 | 116,980 | 475,990 | 341,766 | 817,756 |
| 1961 | 150,052 | 131,402 | 114,829 | 112,416 | 508,699 | 345,942 | 854,641 |
| 1962 | 141,530 | 149,902 | 131,271 | 114,714 | 537,417 | 346,573 | 883,990 |
| Estimated | | | | | | | |
| 1965 | 188,363 | 137,932 | 136,840 | 141,104 | 604,239 | 394,701 | 998,940 |
| 1970 | 200,165 | 189,589 | 189,905 | 188,125 | 767,784 | 517,753 | 1,285,537 |
| 1975 | 223,288 | 220,104 | 218,009 | 207,566 | 868,967 | 595,053 | 1,464,020 |
| 1980 | 213,958 | 225,592 | 226,150 | 226,435 | 892,135 | 669,643 | 1,561,778 |
| 1985 | 240,529 | 236,438 | 232,355 | 232,589 | 941,911 | 644,064 | 1,585,975 |

Source: 1960 - 1960 Census of the Population (PC(1) 37 B, Table 16, pg. 55

1965-80 Estimates computed on a cohort basis from above Census and Table.

1985 based on birth rate data in Table 2.

## Table 8

## High School Graduates In Ohio, 1930-1985
## by Geographic Area

| | Area | 1946 | 1950 | 1955 | 1960 | 1965 | 1970 | 1975 | 1980 | 1985 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. | Cleveland Area | 13,072 | 12,512 | 13,957 | 21,428 | 31,645 | 36,190 | 43,273 | 44,097 | 49,789 |
| 2. | Northwest Area | 8,430 | 7,904 | 9,012 | 12,211 | 15,822 | 17,775 | 20,877 | 20,797 | 23,163 |
| 3. | Southwest Area | 13,897 | 13,445 | 15,678 | 22,761 | 33,905 | 38,752 | 46,310 | 47,370 | 53,686 |
| 4. | Central Area | 9,624 | 8,890 | 10,920 | 16,121 | 22,604 | 25,781 | 30,747 | 31,387 | 35,502 |
| 5. | Southeast Area | 7,384 | 6,972 | 8,406 | 9,851 | 11,019 | 11,689 | 13,096 | 12,709 | 13,638 |
| 6. | Northeast Area | 15,330 | 12,693 | 15,082 | 20,969 | 26,277 | 29,945 | 35,492 | 36,202 | 40,698 |
| 7. | Total | 67,737 | 62,416 | 73,055 | 103,341 | 141,272 | 160,132 | 189,795 | 192,562 | 216,476 |

Source: 1946-60 - State of Ohio unpublished educational data - tabulated from public high school graduatesby county with private school total distributed by metropolitan areas.

Totals from Table 9.

Estimates based on population changes calculated in Table 3.

## Table 9

## High School Graduates in Ohio Compared with the Number of 18-Year-Olds, 1930-1985

| Year | Number of High School Graduates | Number of 18-Year-Olds in the Population. | Graduates as a Percentage of 18-Year-Olds |
|---|---|---|---|
| Actual | | | |
| 1930 | 42,463 | 117,025 | 36.3 |
| 1940 | 73,450 | 130,031 | 56.5 |
| 1950 | 62,416 | 102,200 | 61.1 |
| 1959 | 90,184 | 115,059 | 78.4 |
| 1961 | 106,025 | 150,052 | 70.7 |
| 1963 | 101,830 | 138,615 | 73.5 |
| Estimated | | | |
| 1965 | 141,272 | 188,363 | 75.0 |
| 1970 | 160,132 | 200,165 | 80.0 |
| 1975 | 189,795 | 223,288 | 85.0 |
| 1980 | 192,562 | 213,958 | 90.0 |
| 1985 | 216,476 | 240,529 | 90.0 |

Source: Graduates - 1930-63 State of Ohio educational data

18 Year Olds - 1959-75 - Table 7
1940-50 - Census of the Pop. Vol. II, Part 35, Table 51, pg. 199
1930-40 - Census of the Population

Projections of high school graduates based on projection of 18-year-olds as a best alternative on the assumption that the bulk of high school graduates are that age.

Graduates estimated to be 90% of 18-year-olds by 1980.

## Table 10

## Total Fall Enrollments in Colleges and Universities in Ohio, 1958 - 1985 Compared with the Number of 18-24 Year Olds in the State

| Fall of Year | Total Enrollments | Number of 18-24 Year Olds | Percentage |
|---|---|---|---|
| Actual | | | |
| 1958 | 156,385 | N.A. | N.A. |
| 1960 | 175,139 | 817,756 | 21.4 |
| 1962 | 202,374 | 885,073 | 22.9 |
| Estimated | | | |
| 1964 | 237,555 | 957,864 | 24.8 |
| 1965 | 257,727 | 998,940 | 25.8 |
| 1970 | 393,374 | 1,285,537 | 30.6 |
| 1975 | 518,263 | 1,464,020 | 35.4 |
| 1980 | 627,835 | 1,561,778 | 40.2 |
| 1985 | 713,689 | 1,585,975 | 45.0 |

Source: 18-24 Yr. Olds from Table 6.

Enrollments - 1958 - Opening Fall Enrollment in Higher Education, 1958, HEW, Office of Education, Table 1, pgs. 23 and 24

1960 - Opening Fall Enrollment in Higher Education, 1960, HEW, Office of Education, pg. 25

1962 - Opening Fall Enrollment in Higher Education, 1962, HEW, Office of Education, pg. 26

Estimated enrollments based on assumption that enrollment in 1985 will be 45% of total 18-24 year old group.

(2) a combination of economic and social forces will operate to keep children in school longer. These include the impact of automation on the job market, higher income levels, a raising of national goals, etc. The figures on high school graduates include both private and public school graduates. Data on public school graduates were available by county. The private and parochial school data are based upon state totals distributed by area in accordance with the distribution of larger cities in each geographic area of the state.

## Enrollment Trends in Ohio's Colleges and Universities - Tables 10-15

The record so far shows that most reputable forecasts have tended to err on the low rather than the high side. The projections set out in Table 10 reflect the many potent forces increasing the demand for higher education in Ohio. This results in a dramatic increase in the proportion of eligibles who will go to college during the next two decades, from 22.9% of the 18-24 year olds in 1962 to 45% in 1985 — a doubling in the next twenty years. This more than triples enrollments in Ohio's institutions of higher learning by 1985 (Table 10). Several factors seem to explain a good deal of the expected increase in college attendance. First of all, as mentioned earlier, we are undergoing a major technological revolution, one which is demanding higher and higher levels of academic achievement to obtain employment. Where once a high school diploma was adequate for initial employment in a wide range of jobs, it is no longer so; and the situation is further worsened by "displaced" workers in search of jobs. Secondly, many of the latter will choose to return to school for advanced degrees or training for new or more advanced skills. This will further swell the demand for higher education among adults pas the 24 year cut off utilized in our projections. This, in essence, extends the eligibles pool beyond the 24 year age group. Perhaps 18 to 34 would be a more realistic range. A third factor is the increased levels of income in prospect which makes it financially feasible for the young to go to college and also stimulates their desire to do so as they revise their goals in living. Many other intangible influences could be cited, not the least being the emphasis rightly or wrongly in this scientific age, on more education per se. As the deprived segments of our population reap the benefits of both crash and long-run programs to raise their levels of primary and secondary education, this will further swell the demand for higher education. Finally, Ohio has long been a center of learning to which students from other states have gravitated. There is no reason to believe that this will be changed, so I have conservatively estimated that the number of out-of-state students will double from 1963 to 1985 (Table 11) leading to a net in-migration by that time of 16,000 compared with the current total of approximately 8,000 (Table 12). Also indicated are the number of Ohio residents likely to leave the state for colleges elsewhere.

## Further Analysis of the Enrollment

Tables 13, 14, and 15 go beneath the broad aggregate of total enrollments; for effective planning requires as much detail as possible about levels of college enrollment, part-time, full-time distribution, and the geographic origins according to these latter classifications.

Two critical assumptions explain the trends shown in Table 13: the percentage of part-time students is increased from 30% of the total in 1963 to 40% in 1985. Many reasons could be advanced to justify this assumption. Suffice it to say that a significant increase in adult education, employer sponsored part-time programs and part-time general

# Table 11

## Fall Enrollments in Colleges and Universities in Ohio, 1949-85 State as a Whole Classified as betwenn In-State and Out-of-State Students

| Year | In-State | Out-of-State |
|---|---|---|
| Actual | | |
| 1949 | 119,584 | 23,147 |
| 1958 1/ | 112,852 | 27,720 |
| 1963 1/ | 165,569 | 42,047 |
| Estimated | | |
| 1965 | 212,227 | 45,500 |
| 1970 | 339,249 | 54,125 |
| 1975 | 455,513 | 62,750 |
| 1980 | 556,460 | 71,375 |
| 1985 | 633,689 | 80,000 |

Source: 1949 - Residence and Migration of College Students, 1949-50, Federal Security Agency, Office of Education, Table 1, pgs. 14-15.

1958 - A Supplement to Home State and Migration of American College Students, Fall 1958, A.A.C.R.A.O., Committee on Research and Service, pg. 19

1963 - Highlights from the Survey of Residence and Migration of College Students, Fall 1963, Hew, Office of Education, Table 1, pg. 3.

1/ Total of In-State and Out-of-State is slightly less than total enrollments in our other tables because of omission of certain categories of enrollment.

## Table 12

### Migration of College and University Students In and Out of Ohio

| Year | Number of Out of State Students Attending Ohio College and Universities | Number of Ohio Students Going to College Outside of State | Net Migration In (+) Out (-) |
|---|---|---|---|
| Actual | | | |
| 1949 | 23,147 | 21,615 | + 1,532 |
| 1958 | 27,720 | 23,596 | + 4,124 |
| 1963 | 42,047 | 33,828 | + 8,219 |
| Estimated | | | |
| 1965 | 45,500 | 36,500 | + 9,000 |
| 1970 | 54,125 | 43,375 | +10,750 |
| 1975 | 62,750 | 50,250 | +12,500 |
| 1980 | 71,375 | 57,125 | +14,250 |
| 1985 | 80,000 | 64,000 | +16,000 |

Source:
1949 - Residence and Migration of College Students, 1949-50, Federal Security Agency, Office of Education, Table 1, pgs. 14-15.

1958 - A Supplement to Home State and Migration of American College Students, Fall, 1958, A.A.C.R.A.O., Committee on Research and Service, pg. 19.

1963 - Highlights from the Survey of Residence and Migration of College Students, Fall, 1963, HEW, Office of Education, Table 1, pg. 3.

## Table 1[illegible]

## Fall Enrollments in Colleges and Universities in Ohio, 1959-1985 State as a Whole Classified as between Full Time and Part Time Students and Undergraduate or Graduate Status

| Fall of Year | Full Time | | Part Time | | Total | | |
|---|---|---|---|---|---|---|---|
| | Undergraduate | Graduate | Undergraduate | Graduate | Undergraduate | Graduate | Total |
| Actual | | | | | | | |
| 1959 | 106,982 | 3,832 | 44,308 | 9,253 | 151,290 | 13,085 | 164,375 |
| 1961 | 125,585 | 5,144 | 47,165 | 10,122 | 172,750 | 15,266 | 188,016 |
| 1963 | 143,158 | 7,040 | 52,456 | 12,135 | 195,614 | 19,175 | 214,789 |
| Estimated | | | | | | | |
| 1964 | 157,024 | 8,196 | 58,913 | 13,422 | 215,937 | 21,618 | 237,555 |
| 1965 | 168,811 | 9,278 | 64,690 | 14,948 | 233,501 | 24,226 | 257,727 |
| 1970 | 245,465 | 17,308 | 105,425 | 25,176 | 350,890 | 42,484 | 393,374 |
| 1975 | 307,330 | 27,468 | 148,223 | 35,242 | 455,553 | 62,710 | 518,263 |
| 1980 | 352,843 | 38,298 | 190,862 | 45,832 | 543,705 | 84,130 | 627,835 |
| 1985 | 378,255 | 49,958 | 229,808 | 55,668 | 608,063 | 105,626 | 713,689 |

Source: 1959
Total Enrollment in Institutions of Higher Education 1959-60, HEW, Office of Education, Table 6, pg. 6.

1961
Enrollment for Advanced Degrees - Fall 1961, Office of Education, HEW, Table 14, pg. 29
Ohio Educational Data
Opening Fall Enrollment in Higher Education, 1961, HEW, pgs. 24-25

1963
Opening Fall Enrollment in Higher Education, 1963, HEW, pgs. 30-31
Ohio data

Totals taken from Table 15.

Full time, part time breakdown assumes increase in share of part time to 1985.

education programs are anticipated. In line with the higher levels of expertice required in industry and elsewhere, graduate enrollments are anticipated to rise from about 9% of the total to about 15% by 1985. In breaking down the total enrollments by area of residence of the students (where they will come from) the following procedure was adopted in the absence of any significant hard data upon which to project these distributions. There were no area breakdown of enrollments, so first, the grand total of part-time students was distributed according to the numbers and relative sizes of the colleges and universities in each area. This is based upon the common sense observation that part-time students are most likely to go to local colleges and universities. Full-time students were assumed to originate from the six areas proportionately to the population distributions and projections presented earlier. (Table 14). Enrollments have also been classified as to whether they are in private or public institutions (Table 15). The back data originate in various tabulations of both the Office of Education and the state of Ohio; the projections assume that the public institutions will carry the heavier burden of future enrollment increases. They are projected to constitute 75% of total enrollments by 1985 in contrast to the 58.4% of the total enrollments in 1963. Actually, it is not assumed that the percentage of private enrollments will decline as steeply as assured on the national level in a recent study for the Fund For The Advancement of Education, "The Outlook for Higher Education"; primarily because of the large numbers of well known private institutions of higher education in Ohio.

## Table 14

## Fall Enrollments in Colleges and Universities in Ohio, 1963 and 1975 Classified by Areas of Residence of the Students

| Area | 1963 | | 1975 | | | |
|---|---|---|---|---|---|---|
| | Part Time | Full Time | Part Time | % Increase | Full Time | % Increase |
| 1. Ohio students residing in: | | | | | | |
| a. Cleveland Area | 12,851 | 24,707 | 40,397 | 214.3 | 63,458 | 156.8 |
| b. Northwest Area | 5,264 | 12,353 | 19,491 | 270.3 | 30,616 | 147.8 |
| c. Southwest Area | 20,887 | 26,472 | 43,234 | 107.0 | 67,911 | 156.5 |
| d. Central | 6,869 | 17,648 | 28,705 | 317.9 | 45,088 | 155.5 |
| e. Southeast Area | 3,678 | 8,603 | 12,226 | 232.4 | 19,204 | 123.2 |
| f. Northeast Area | 12,894 | 20,516 | 33,137 | 157.0 | 52,046 | 153.7 |
| g. Total | 62,443 | 110,299 | 177,190 | 183.3 | 278,323 | 152.3 |
| 2. Out-of-state students attending Ohio colleges and universities | 2,148 | 39,899 | 6,275 | 192.1 | 56,475 | 95.5 |
| 3. Total | 64,591 | 150,198 | 183,465 | 184.0 | 334,798 | 122.9 |

Source: Totals from Table 11 and Table 13.
Out-of-state totals from Table 13
Distribution based on Ohio data and population changes from Table 3.

## Table 15

## Fall Enrollments in Colleges and Universities in Ohio, 1958-1985 State as a Whole Classified as between Enrollments in Public and Private Institutions

| all of Year | Public<br>Undergraduate | Public<br>Graduate and Professional | Public<br>Total | Private<br>Undergraduate | Private<br>Graduate and Professional | Private<br>Total | Total |
|---|---|---|---|---|---|---|---|
| ctual | | | | | | | |
| 959 | 81,214 | 8,355 | 89,569 | 70,076 | 4,730 | 74,806 | 164,375 |
| 961 | 95,659 | 9,638 | 105,297 | 77,091 | 5,628 | 82,719 | 188,016 |
| 963 | 112,755 | 12,720 | 125,475 | 82,859 | 6,455 | 89,314 | 214,789 |
| stimated | | | | | | | |
| 1964 | 125,667 | 14,728 | 140,395 | 90,270 | 6,890 | 97,160 | 237,555 |
| 1965 | 137,626 | 17,010 | 154,636 | 95,875 | 7,216 | 103,091 | 257,727 |
| 1970 | 218,716 | 31,470 | 250,186 | 132,174 | 11,014 | 143,188 | 393,374 |
| 1975 | 300,593 | 48,717 | 349,310 | 154,960 | 13,993 | 168,953 | 518,263 |
| 1980 | 379,212 | 67,806 | 447,018 | 164,493 | 16,324 | 180,817 | 627,835 |
| 1985 | 447,483 | 87,784 | 535,267 | 160,580 | 17,842 | 178,422 | 713,689 |

Source: 1959 - Total Enrollment in Institutions of higher education 1959-60, Office of Education, HEW, Table 8, pg. 44

1961 and 1963 - State of Ohio Educational Data and Enrollment for Advanced Degrees - Fall, 1961, Office of Education, HEW, Table 14, pg. 29.

Totals from Table 10.

Estimates based on projection of public-private and undergraduate-graduate relationships.

## The Income and Expenditure Picture

Although the Department of Commerce is the basic source for data on personal income, they do not look into the future. Some idea of what the personal income base will be in Ohio in the decades ahead is indicated in a forecast made by the National Planning Commission for the Outdoors Recreation Commission. Table 16 presents the Department of Commerce's actual data, the N.P.A. projection for 1976, in constant dollars, and, then, my interpolations for 1965 and 1970.

In Table 17, expenditure data for the teaching of students in 1957-58 are presented for both public and private institutions in Ohio and a number of other states. This analysis, although it would be better if data were available for a more recent year, gives some idea of the ranking of states. It can be seen that Ohio is at about the middle of the range. This data is based upon pioneering work done by Drs. Selma Mushkin and Eugene McLoone for the National Planning Association and the Heald Committee and extended in a study for the Office of Education. Their limited list of states is extended in this study on the basis of unpublished data of the Office of Education. Finally, on the basis of the work of Selma Mushkin in her report done for the Office of Education on "Tax Dollars" furnished by State and Local governments for teaching students in colleges and universities, Table 18 contains a comparison of the Ohio contribution with those of a number of the states in 1957-58.

## Table 16

## Gross Personal Income -- Ohio and the United States as a Whole 1950-1976 (Millions)

| Year | Ohio | | U.S. as a Whole | | Ohio as a Percentage of United States as a Whole |
|---|---|---|---|---|---|
| | Amount | Source of Estimate | Amount | Source of Estimate | |
| Actual (current dollars) | | | | | |
| 1950 | 12,891 | Commerce | 225,473 | Commerce | 5.72 |
| 1951 | 14,892 | " | 252,960 | " | 5.89 |
| 1952 | 15,908 | " | 269,050 | " | 5.91 |
| 1953 | 17,316 | " | 283,140 | " | 6.12 |
| 1954 | 17,241 | " | 285,339 | " | 6.04 |
| 1955 | 18,589 | " | 306,598 | " | 6.06 |
| 1956 | 19,901 | " | 330,380 | " | 6.02 |
| 1957 | 20,906 | " | 348,724 | " | 5.99 |
| 1958 | 20,494 | " | 357,498 | " | 5.73 |
| 1959 | 21,977 | " | 381,326 | " | 5.76 |
| 1960 | 22,722 | " | 399,028 | " | 5.69 |
| 1961 | 23,090 | " | 414,954 | " | 5.56 |
| 1962 | 24,156 | " | 439,661 | " | 5.49 |
| 1963 | 25,263 | " | 460,580 | " | 5.49 |
| stimated (1960 dollars) | | | | | |
| 1976 | 43,040 | N.P.A. | 803,000 | N.P.A. | 5.36 |

Source: 1950-53 - Personal Income by States Since 1929, Table 1, pp. 140-41

1954-63 - Survey of Current Business, August 1962, Table 1, pg. 11 and current releases.

1976 Estimates - ORRRC Study Report 23 - Projections to the Years 1976 and 2000: Economic Growth, Population, Labor Force and Leisure, and Transportation, Table F-18, pg. 420.

1965 and 1970 interpolated from 1976 estimates.

## Table 17

### Expenditures for Teaching Students in all Public and Private Colleges and Universities in Selected States, 1957-1958.

| State | Total Expenditures (in Millions) | Expenditures per Full-Time Student Equivalent | Expenditures as Percentage of Personal Income |
|---|---|---|---|
| Arkansas | $ 16.0 | $ 689 | .76 |
| California | 237.2 | 830 | .65 |
| Colorado | 25,8 | 658 | .75 |
| Connecticut | 40.7 | 1,228 | .63 |
| Illinois | 143.6 | 1,070 | .60 |
| Indiana | 67.5 | 925 | .74 |
| Iowa | 38.9 | 799 | .75 |
| Kansas | 33.0 | 732 | .82 |
| Massachusetts | 114.4 | 1,119 | .99 |
| Michigan | 120.5 | 1,033 | .72 |
| Minnesota | 47.8 | 801 | .76 |
| Missouri | 52.0 | 796 | .61 |
| Nebraska | 19.8 | 751 | .73 |
| New Jersey | 46.9 | 908 | .33 |
| New York | 268.6 | 1,080 | .65 |
| North Carolina | 49.2 | 813 | .80 |
| Ohio | 114.0 | 910 | .55 |
| Oklahoma | 28.3 | 607 | .74 |
| Pennsylvania | 135.8 | 913 | .58 |
| Texas | 100.0 | 638 | .59 |
| Wisconsin | 45.1 | 759 | .59 |

Source: Economics of Higher Education, Selma Muskin Chapter, Table 4.

Meeting the Increased Demand for Higher Education in New York State, Table 17, pg. 66

Survey of Current Business, August 1961, Personal income by state.

## Table 18

### "Tax Dollars" Furnished by State and Local Governments for Teaching Students in Colleges and Universities and Providing Scholarships in Selected States (1957-1958)
### (Current Funds Only)

| State | Total Amount (in millions) | Amount per Capita | Percentage of Personal Income |
|---|---|---|---|
| Arkansas | $ 12.9 | $ 7.36 | .61 |
| California | 205.4 | 15.17 | .56 |
| Colorado | 16.7 | 10.29 | .49 |
| Connecticut | 11.5 | 5.08 | .18 |
| Illinois | 78.0 | 8.08 | .32 |
| Indiana | 38.5 | 8.55 | .42 |
| Iowa | 28.6 | 10.29 | .55 |
| Kansas | 23.0 | 11.17 | .57 |
| Massachusetts | 11.4 | 2.39 | .10 |
| Michigan | 90.7 | 11.82 | .54 |
| Minnesota | 33.5 | 10.12 | .53 |
| Missouri | 21.5 | 5.12 | .25 |
| Nebraska | 14.7 | 10.32 | .54 |
| New Jersey | 17.5 | 3.15 | .12 |
| New York | 87.1 | 5.41 | .21 |
| North Carolina | 22.7 | 5.18 | .37 |
| Ohio | 40.9 | 4.44 | .20 |
| Oklahoma | 21.2 | 9.54 | .55 |
| Pennsylvania | 36.6 | 3.32 | .16 |
| Texas | 68.4 | 7.61 | .41 |
| Wisconsin | 29.5 | 7.65 | .39 |

Source: Economics of Higher Education, Selma Muskin Chapter, Tables 9 and 10

Meeting the Increased Demand for Higher Education in New York State, Table 18, pg. 67,

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